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Abstract

This report describes the development and implementation of a 2-year program designed to prepare 32 undergraduates for roles in educational research. An evaluation of the program's success is made on the basis of the following five major objectives: (1) To develop competencies necessary to conduct educational research, (2) to develop favorable attitudes toward educational research, (3) to prepare prospective teachers for their roles as participants in and as consumers of educational research, (4) to interest talented undergraduates in graduate work and careers in educational research, and (5) to provide talented assistants for faculty researchers. The major activities of the program are also evaluated, including a weekly seminar on research methods, work with a faculty member as a research assistant, and visits to various research settings. The appendix contains (1) the course outline for the seminar, (2) a bibliography of research products in which the trainees participated, (3) excerpts from program evaluations made by student and faculty participants, and (4) papers by two trainees describing their involvement in the research process. A related document is EA 002 688. [Table I may reproduce poorly due to marginal legibility] (JH)

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FINAL REPORT

Project Number 51-R523

Grant Number OE 2062-82-355

# PURDUE UNDERGRADUATE PARTICIPATION PROGRAM IN EDUCATIONAL RESEARCH

November, 1968

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HEALTH, EDUCATION, AND WELFARE

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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# Purdue Undergraduate Participation Program

# in Educational Research

Project Number 51-R523
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Purdue University

Lafayette, Indiana

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## I. Introduction

Increased Federal support for research in education has encouraged investigations to determine the value of current educational practices and to seek new and better means of facilitating learning. There is a need for well-trained researchers with an interest in education and for teachers with an interest in research. The training program described in this report was meant to develop both types of personnel.

The objectives of the program were: (1) to develop certain competencies necessary to conduct educational research, (2) to develop favorable attitudes toward educational research as a guide to educational practice, (3) to prepare prospective teachers for their future roles as participants in and consumers of educational research, (4) to interest talented undergraduates in graduate work and careers in educational research, and (5) to provide talented assistants for faculty researchers.

The various aspects of the program described in the following section were meant to implement these objectives. The training program will be evaluated in terms of these objectives. There were twenty trainees in the first year of the program and twelve in the second year.

## II. Description of the Training Program and Evaluation Procedures

The program consisted of four main parts: a weekly seminar, participation in research activities with a faculty member, field trips to other universities and a professional convention, and special summer training programs for a selected sub-group of trainees. Each of these aspects of the program will be described below.

The Seminar. The trainees participated in a weekly, three-hour seminar each semester for which six credits were earned. During the first year of the program the seminar was conducted by Dr. Terry Denny and Dr. David Douglas Starks, in the second year, Dr. Adrian Van Mondfrans.

In the seminar the basic concepts of statistics, measurement, and research design were considered. Further, at many of the seminars one or more guest researchers made formal presentations of the research they were conducting or informally discussed experimental design, data collection and reduction procedures, and results of their research with the students. Guests during the first year included Sister Carla Marie, Principal of the Webster College Experimental School, Webster Groves, Missouri; Dr. Irving

Morrissett, Director of the Social Science Education Consortium; Dr. Samuel Wientraub, Department of Reading Research, University of Chicago; Mr. John Pyper, University of Oregon, and Mr. Adrian Van Mondfrans, University of Wisconsin. Guests during the second year were Dr. David Starks, University of Michigan; Dr. Samuel Guskin, Indiana University; Dr. Howard Spicker, Indiana University; Mr. Uldis Smidchens, University of Michigan; Dr. Ellis Page, University of Connecticut; Dr. H. H. Remmers, Professor Emeritus, Purdue University; and Mr. Donald Treffinger, Cornell University. These distinguished researchers discussed a variety of topics with the trainees. In addition, all of the Purdue research staff directly associated as supervisors of the undergraduate trainees made similar presentations in the seminars.

When a cooperating faculty member presented his research the trainee assigned to him often participated in the presentation. Through these presentations the trainees became acquainted with the theory, methods of research and problems in a wide variety of research areas. The trainees gained valuable experience in evaluating experimental designs and test results and in presenting technical information.

Textbooks in measurement (1)*, statistics (2,3) and research design (4) were used. A special 200 volume library comprised of reference works in appropriate research areas, statistics, measurement and design texts and current research journals was especially provided for the use of the trainees.

Research Participation. Each trainee worked with his cooperating professor from eight to ten hours a week on a research project. The professor was requested to involve the trainee in all phases of research activity to provide the most comprehensive training possible. The trainees received training in planning research projects, developing or analyzing relevant theory and research design, gathering data, analyzing and interpreting experimental results, and writing reports. All of the trainees participated in two or more of the activities just mentioned according to their descriptions of what they did.

Field Trips. During the first year of the program the trainees participated in the following field trips:

October 10, 1966: Trainees spent the day at Science Research Associates in Chicago discussing the role of private industry in educational research.

November 8, 1966: The trainees traveled to St. Louis, Missouri to visit Drs. Paul Merrick, (the Shell Game), and Robert Davis, (the Madison Project) concerning new developments in school curricula.

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*The number refers to the number of bibliographical listing.

They also observed the pre-school operant conditioning laboratory of Don Bushnell and participated in a critique session after the observation. This trip prompted so much discussion among the participants that they planned a return visit for March.

January 11, 1967: The trainees visited the University of Illinois to hear about and explore PLATO, the computer-assisted instruction system developed by Professor Donald Bitzer and others. On this trip they also participated in a seminar with the staff of the Center for Instructional Research and Curriculum Evaluation (CIRCE). These experiences gave the undergraduate participants a clearer picture of the developmental growth which educational research is experiencing throughout American education.

February 15 to 18, 1967: The high point of the field trips came in February when the twenty trainees attended meetings, paper readings, and seminars at the American Educational Research Association Convention in New York City. These three days of exposure to "the great names" and to the latest ideas in research, and seeing some of their faculty researchers, (Asher, Denny, Feldhusen), present papers and conduct symposia, perhaps more than any single event during the year, influenced the attitudes of the URT's toward educational research.

March 22, 1967: A group of eight trainees visited the Webster College Campus. This group visited Robert Davis' Madison Project, and the experimental elementary school programs of the Social Science Department.

The field trips for the second year were:

October 5, 1967: Professor Van Mondfrans and five of the trainees went to the University of Michigan to hear Dr. J. Piaget, visiting from Europe, speak.

October 16, 1967: The trainees visited Indiana University where they heard presentations on research by Dr. Mary Rouse, Art Education; Dr. Richard Turner, Institute for Educational Research; Dr. Harvey Black, Audio-visual Center; Dr. Ray Smith, Speech and Theatre; Dr. Nicholas Fattu, Director of Research and Institute for Educational Research; and Drs. Howard Spicker and Samuel Guskin, Department of Special Education. The topics ranged widely and included descriptions of the development of an objective art evaluation form, a research project in audio-visual information transmission, and a preschool project for deprived children. The trainees asked many questions and were excited about several of the projects. They decided to ask two of the researchers to present seminars in Lafayette.

February 7 to 10, 1968: The twelve trainees and seven of their cooperating professors attended the American Educational

Research Association Convention in Chicago. They attended paper reading sessions, seminars, colloquia and met several of the "great names" in informal settings. Several of the accompanying faculty members presented papers (Feldhusen, Johnson, Kane, Linden, and Van Mondfrans). In addition, one of the trainees from the previous year (Ronald Houser) presented a paper. The trainees rated this experience very highly (see the section on Evaluation).

May 3, 1968: The University of Illinois was the host of the last field trip of the year. The trainees heard about and interacted with PLATO, visited CIRCE, explored a television studio and viewed a micro-teaching demonstration, and heard a description of the various projects of the Training Research Laboratory.

The field trips served several functions. They introduced the trainees to a sample of the research going on at particular institutions and across the country. The trainees met some of the prominent men in educational research thus increasing the scope of their graduate school aspirations and opportunities. Also, the comraderie and interpersonal commitment of the group increased. The trainees became more involved in other research projects and supported each other more. Further, they interacted more with graduate students and other faculty members and developed the feeling of professional belonging which characterizes the relationship of faculty and graduate students.

Special Summer Training Program. During the summer of 1967, seven trainees who had been in the program during the preceding school year program were selected to continue in a special summer program under the direction of Professor Feldhusen. The summer program was intended to provide the following experiences:

(1) Closer association and more prolonged contact with faculty researchers. Thus, the summer trainees were to be on the job forty hours a week, spending twenty hours with each of two faculty researchers or forty hours with one.

(2) Participation in culminating phases of several research projects. Several of the trainees had been working on projects for which major final data reduction, interpretation and reporting could not be accomplished until summer. Thus the opportunity to work with projects to these final phases was provided.

(3) A field trip to the Research and Development Center, the project on computer-assisted instruction, and the Primate Laboratory at the University of Wisconsin.

(4) Meetings of the group were also held once a week to discuss research, field trips, and papers and reports presented

to the group.

The summer trainees, the professors with whom they worked, and the nature of their research experiences were as follows:

Joe Shively worked with Professor Ronald Johnson on a study of verbal learning and with Professor Robert Snodgrass on a study of test reliability.

Ronald Houser worked with Professor J. William Asher on a driver education study and with Professor Kathryn Linden on a study of teacher attitudes.

Mary Wall worked with Professor Ernest McDaniel on the development of a test of cognitive preferences and with Professor John Feldhusen on the analysis of longitudinal achievement data.

Mary Sue German (half-time) worked with Professor Terry Denny on an evaluation of the Undergraduate Research Training Program.

Diane Kendall (half-time) worked with Professor Phyllis Lowe on a research evaluation of home economics education curricula.

Mary Beth Muller and Sarah Jo Fosbrink worked with Professors Feldhusen, Denny and Starks on the final analyses of a longitudinal study of creative abilities.

During the summer of 1968, two trainees from the scholastic year program of the year before continued their efforts.

Donna Burkhart worked under the direction of Dr. Feldhusen and Mrs. Sue Bahlke. She scored creativity tests and prepared data for analysis for a project in which the effects of various components of a creativity training program were evaluated. She also aided Drs. Feldhusen and Van Mondfrans in a study of the effects of four different formats of creativity testing.

Linda Hensley (one-quarter time) worked with Donna on the first project mentioned above.

Both trainees had the opportunity to interact considerably with graduate students during the summer.

Evaluation Procedures. During the 1966-1967 training program an effort was made to secure feedback and evaluation from trainees in order to assess the effectiveness of the program and to plan future operations and revisions. The following procedures were

used:

(1) All trainees were interviewed individually to secure their reactions to all aspects of the program.

(2) Each trainee wrote an evaluation of the program and suggestions for improving the program and the selection procedures.

(3) Achievement tests were given on the subject matter covered in the course.

(4) Outside problems were assigned and graded.

(5) The trainees' research presentations in the seminar were evaluated.

(6) An evaluation of each trainees' work was secured from the cooperating professor.

(7) There was much informal evaluation of the trainees and the program by the research professors involved in the program.

During the second year of the program similar evaluation procedures were followed. However, in addition to the personal interview to secure reactions to all aspects of the program, a rating sheet was given (see Appendix A). On the rating sheet each aspect of the program was given a rating of from one to five with respect to four different types of outcomes: (1) arousing interest in or motivation to learn the skills of educational research, (2) potential value to the trainee as a future teacher or researcher, (3) amount learned, and (4) impact on the trainee's future plans with respect to educational research.

## III. The Results of the Program Evaluation

The objectives of this training program were: (1) to develop certain competencies necessary to conduct educational research, (2) to develop favorable attitudes toward educational research as a guide to educational practice, (3) to prepare prospective teachers for their future roles as participants in and consumers of educational research, (4) to interest talented undergraduates in graduate work and careers in educational research, and (5) to provide talented assistance for faculty researchers. The success of the program will be evaluated in terms of meeting these objectives. The reactions of students to the various aspects of the program will also be discussed.

Evidence of Student Competence in Research. The evidence of student growth in the area of research competence comes basically

from two sources: (1) a consideration of what the students were asked to do in the seminar and (2) a listing of the actual products which resulted from research projects in which the trainees participated.

In the seminar the students were required to compute and use the common descriptive statistics (measures of central tendency, measures of dispersion, and measures of relation) and several of the most useful inferential statistics (t-tests, Chi-square, and F-Tests). (See Appendix B for a complete listing of topics covered during the first year. The second years' program was similar.) In addition, instruction was given in the preparation of data for computer analysis. Several of the students used the computer in analyzing the data they had collected. Student reaction to the statistics instruction was mixed with 16 of the 20 trainees in the first year's program specifically mentioning this area in their interview or critique of the program. Of these, five students remarked that statistics had been greatly clarified, two mentioned that they had great difficulty with statistics, four suggested that the entering level of statistical knowledge be assessed (indicating that the level of initial instruction had been inappropriate for them - a result of not requiring a basic statistics course as a prerequisite), two remarked on the texts used (they did not feel they were as valuable as most texts), and three students were concerned about the practical value of the statistical portion of the course.

Of the twelve participants for the second year only two mentioned statistics specifically in their interviews or program critiques. Both felt that more statistical training would have been desirable. These two trainees had strong mathematics backgrounds.

Thus, it appears that of the 32 participants in the program only three expressed any doubt concerning the appropriateness of the statistics portion of the seminar. The instructors were very satisfied with the performance of almost all of the trainees on the statistics problems and exercises.

In the area of measurement the trainees were presented with the concepts and principles usually associated with a basic measurement course (see Appendix B for a complete listing of the topics covered during the first year. The second year's program was similar). No adverse comments concerning the measurement part of the seminar were noted in the interviews or written comments of the trainees. At least ten of the 32 trainees were involved in projects in which test development or refinement was a part of their duties. Further, almost all of the trainees were involved in administering or scoring an evaluation instrument of some kind, so they were likely to see the relevance of measurement concepts and principles to research. The instructors were satisfied with the performance of all of the

trainees in this aspect of the seminar.

The other aspects of the coursework in the seminar did not receive specific mention by the students in their course evaluations. When the trainees for the second year were asked to rate the various aspects of the program they rated the presentations by the instructor (Van Mondfrans) across the four different types of outcomes highly (the overall mean rating across the four types of outcomes was 4.22 on a 5-point scale with 3 average and 5 high. See Table 1). Only participation in the research activities of the cooperating professor (mean rating = 4.375) and the overall rating for the AERA convention trip (mean rating = 4.4375) were rated higher. This suggests that the trainees valued the coursework in the seminar to a considerable extent (the data in Table 1 will be discussed further in the following sections). It seems likely that students who value an activity highly will make a good effort to do it well. In this case, the positive evaluation of the coursework may be related to the observation by the instructor that the trainees did very well in the course.

Further evidence of the development of research competence by the trainees is presented by a listing of the research reports, journal articles, and other products which resulted from the projects on which the trainees worked. While the total number of such products which will eventually appear is not known at this time because not all of the projects on which trainees worked have been completed and some papers submitted to journals are still being evaluated, at present trainees have made substantial contributions to projects which have resulted in nine technical reports, eight papers presented at national professional conventions (trainees appear as authors or acknowledged in footnotes on six of these), five articles either published or in press in professional journals (trainees appear as co-authors on two of these), three mimeographed reports, two computer-assisted instruction programs, and one Ph.D. dissertation and one master's thesis. In addition, it is known that four journal articles are in preparation on which trainees will be acknowledged as either co-author or in a footnote. It is expected that other projects will still result in a tangible product. Several copies of most of the products mentioned or abstracts of them are included with this report. A bibliography of the products is included in Appendix C.

## Evidence the Trainees Developed Favorable Attitudes Toward Educational Research

The reaction of the trainees to the research training program was assessed in two ways: (1) All the trainees wrote a brief evaluation of the program and (2) the trainees from the second year responded to a questionnaire.

Table 1.
Means and standard deviations of ratings* of various aspects of the Purdue Undergraduate Research training program by the second year trainees.

| Type of Outcome | Type of Activity: 1. Participation in the research activities of the cooperating professor. | 2. Fieldtrips to other Universities (overall rating). | 2A. Listening to presentations by researchers of their projects. | 2B. Visiting various types of laboratory situations and viewing or participating in the various types of tasks. | 3. AERA trip (overall rating). | 3A. Going to paper reading sessions or invited addresses. | 3B. Interacting with other URTs, graduate students and professors on an informal basis | 4. Presentations by seminar instructor (Van Mondfrans) | 5. Presentation by Purdue faculty of their research projects. | 6. Interactions with other URTs, graduate students and Professors at Purdue. | Overall ratings for type of outcome. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Arousing interest in or motivation to learn the skills of educational research. | 4.62 (.48) | 4.12 (.60) | 3.38 (.60) | 4.62 (.70) | 4.62 (.48) | 4.00 (.50) | 4.25 (.66) | 4.25 (.43) | 4.38 (.48) | 4.50 (.71) | 4.32 |
| 2. Potential value for me as a future teacher or researcher. | 4.25 (.66) | 3.50 (.87) | 3.62 (.70) | 4.12 (.78) | 4.12 (.60) | 3.62 (.70) | 3.50 (1.22) | 4.62 (.48) | 3.38 (.33) | 4.12 (.78) | 3.94 |
| 3. Amount learned. | 4.38 (.48) | 3.71 (.88) | 4.00 (.50) | 3.88 (.73) | 4.38 (.70) | 3.88 (.78) | 3.75 (1.20) | 3.88 (.33) | 3.50 (.50) | 3.88 (.78) | 3.92 |
| 4. Impact on my future plans with respect to educational research. | 4.25 (.33) | 3.86 (.83) | 4.00 (.71) | 3.88 (.78) | 4.62 (.48) | 4.25 (.83) | 4.00 (1.22) | 4.12 (.60) | 3.88 (.78) | 4.12 (.78) | 4.10 |
| 5. Overall ratings for the various aspects of the program. | 4.38 | 3.80 | 3.88 | 4.12 | 4.44 | 3.94 | 3.88 | 4.22 | 3.91 | 4.16 | |

* All ratings were made using a 5-point scale in which 5 was extremely valuable, 4-above average, 3-average, 2-below average, 1-extremely unvaluable. The top figure in each cell is the mean rating and the figure in parenthesis is the standard deviation of the rating.

From the written evaluations it is clear that the trainees were very enthusiastic about the program. They felt challenged. They enjoyed the opportunity to work with a professor and do something which might have practical value. Several excerpts from the written evaluations are included in Appendix D. to indicate student reaction to the program and in some cases to educational research in general.

In Appendix A. the questionnaire concerning the reaction of the trainees to the various aspects of the program is presented. The means and standard deviations of the ratings for each of the four type of outcomes (arousing interest, value for future role, amount learned, and impact on future plans) of each aspect of the program are presented in Table 1. A rating of five indicated that the aspect of the program being rated was extremely valuable in obtaining the type of outcome being considered. A rating of three indicated average value. The mean ratings range from a low of 3.5 (which is between average and above average) to a high of 4.62 (a rating of 4.62 is between above average and extremely valuable on the scale used).

In considering the outcome "arousing interest in or motivation to learn the skills of educational research it was found that the trainees perceived participation in the research activities of the cooperating professor, visiting various laboratory situations and becoming familiar with the research tasks, and the overall experience of attending the AERA convention most valuable (all had ratings of 4.62) and the experience of listening to researchers at other institutions describe their research as least valuable (a rating of 3.88). In general, student's interest in and motivation to learn to do educational research was aroused by the training program (the overall mean rating for this type of outcome across all aspects of the program was 4.32 which is between above average and extremely valuable on the scale).

When the trainees were asked to evaluate the various aspects of the program in terms of their potential value to them as future teachers or researchers they rated the presentations by the instructor highest, (the mean rating was 4.62), participation in the research activities of their cooperating professors next (the mean rating was 4.25), and field trips to other universities and interacting with other trainees, graduate students and professors at AERA were both rated lowly (the mean rating was 3.5 in both uses). The latter finding suggests that the program directors had been relatively unsuccessful in integrating the undergraduate research trainees into all the on going, informal activities which characterize a national convention.

The overall rating for the outcome "potential value for me

as a future teacher or researcher" across all aspects of the program was 3.94. From these data and the evaluative statements of the trainees it is clear that the trainees perceived the program in a positive manner. Some of the trainees also specifically mentioned an increased appreciation of educational research as a result of participation in the program.

## Evidence the Trainees were prepared for Roles as Participants in or Consumers of Educational Research

The nature of the training program has already been described. It is the opinion of the program instructors that such training does prepare students for participating in and to be intelligent critics of educational research. The listing of research products resulting from projects on which the trainees worked further attests that the trainees were prepared for such roles.

Two of the papers written by trainees describing their research involvement are presented in Appendix E. The experiences these trainees had were not atypical. Their papers were chosen because they were written in an appropriate style. From these papers it is clear that the trainees had a variety of experiences in their research training. This type of training is not available on most campuses for undergraduate students.

When the trainees were asked to rate how much they felt they had learned in the program the average rating was 3.92 across all aspects of the program (between average and above average). The highest rating on this outcome was for participating in the research activities with their cooperating professors (4.38). Students rated listening to presentations of Purdue faculty members of their research projects as being of least value in terms of the amount learned (3.5), but again it should be noted that 3.5 denotes a rating above average.

## Evidence of Interest in Graduate Work and Careers in Educational Psychology

At the end of the first year ten of the 20 trainees entered graduate school, seven went into public school teaching, and three were not able to state their plans. Of those who went into teaching several returned to graduate schools during the next year to gain higher degrees. It is known that at least six of the students in graduate school are pursuing careers directly related to educational research. It is likely that several more of the trainees are doing graduate work in related areas.

Of the twelve trainees from the second year of the program seven entered graduate schools (six of these are in areas related to

educational research), three were not sure of their plans (it appears likely that at least two of these will return to graduate school), and two were not planning on further education.

Three of the trainees who were participants in the program are now taking part in a graduate educational research program at Purdue.

Even though it is not possible to state with assurance how many of the trainees will eventually have careers in educational research, the number of trainees who have begun advanced training in this area is very gratifying. Informal statements by many trainees also indicate a strong interest in returning to graduate work in educational research after a few years of teaching or other work. Those trainees who do not enter into research careers are expected to be better prepared to evaluate research done by others in relation to their personal situations than their peers.

The data in Table 1 show that when asked what impact the program had on the future plans of the trainees they felt it was of considerable worth (the overall rating across all aspects of the program for this outcome was 4.10). The aspect of the program rated as most significant in affecting future plans was the overall rating for AERA attendance (4.62).

### Evidence of Faculty Satisfaction with the Program

The faculty members who cooperated with the trainees in a research project were asked to evaluate their trainees and the program in general. Several illustrative evaluations by professors of their trainees are included in Appendix F. The professors were pleased with the quality and industry of the trainees. There were a few professors who suggested courses as possible pre-requisites for the program.

Professors who worked with trainees were also asked to evaluate the program, (see Appendix G). Their response was generally very enthusiastic. The only problem mentioned by more than one professor was the interruption of the trainees' efforts caused by student teaching.

## IV. Discussion

From the data presented in the preceding sections it is clear that the undergraduate research training program at Purdue was able to meet its objectives to a substantial extent. The trainees were trained to be of significant help in conducting research. They were motivated by the program to learn the skills of research. They were provided the opportunity to apply these skills in a research project. Many of the participants became interested in a career

in educational research.

There were some aspects of the program which could have been improved. In general, the visits to other universities would have been more interesting and valuable to the trainees if more time would have been spent in actually seeing and doing experimental tasks rather than hearing about them.

The experience of attending a professional convention was well-received by the trainees. The visit to AERA had great impact on their future plans and involvement in the seminar. They felt they learned a great deal because of their attendance. The trainees were a little disappointed because the instructors were not successful in integrating them fully into the round of social events which characterize such a convention. This prevented them from enjoying the stimulation which comes from talking with bright, well-known researchers and from making valuable first-hand contacts for later graduate school and employment purposes.

The seminar portion of the program was generally well-received. The sessions on research design and measurement were perceived as relevant and valuable.

The presentations by visiting professors were quite varied in their impact. The only serious question about the seminar arose with respect to the treatment of statistics. Several trainees thought that more depth in treatment was desirable and others thought that the presentation of statistics was too rapid. It appears that it would be difficult to meet the needs of all the trainees in this area unless specific prerequisites were required to standardize previous training.

## V. Conclusions, Implications, and Summary

Conclusions. From the evidence presented it is clear that the objectives outlined for the Purdue Undergraduate Research Training Program were met to a large extent. Almost all of the trainees did become interested in, skilled in conducting, and familiar with a large range of educational research. It is concluded that the program was of great value to the trainees, the professors who worked with trainees, and the university.

Several slight changes in the program were suggested in the discussion section. It is expected that changes along the line of those suggested would increase the effectiveness of the training.

Implications. With the increased commitment to educational research on the part of the federal government and private funding agencies the need for bright, highly skilled researchers has become

great. It is necessary to attract and train bright students in educational research. The Purdue undergraduate research training program was successful in doing this. The overall, long-range impact of this program remains to be seen. Its potential appears extraordinarily great.

As final evidence of the perceived value of the undergraduate research training program the administration of the Education Department at Purdue has adopted the program as part of its responsibility. This first year after the termination of federal support the program is continuing with eighteen trainees.

Summary. The Purdue Undergraduate Research Training Program was instigated as a response to the need for well-trained educational researchers. The participants were selected to be seniors, mainly from education, who were above average scholars. The program had five major objectives: (1) to develop certain competencies necessary to conduct educational research, (2) to develop favorable attitudes toward educational research as a guide to educational practice, (3) to prepare prospective teachers for their future roles as participants in and consumers of educational research, (4) to interest talented undergraduate in graduate work and careers in educational research, and (5) to provide talented assistants for faculty researchers.

In the two years of federal support 32 trainees participated in the program. The objectives of the program were approached through three types of activities: (1) the trainees attended a weekly, three hour seminar in which they heard presentations of research activities by faculty members or studied research design, statistics and measurement, (2) each trainee worked with an active faculty researcher in conducting his research, and (3) the trainees took field trips to other universities and professional conventions to become familiar with the broad scope of educational research.

The success of the program and the performance and attitudes of the trainees were assessed using a variety of measures. From the evidence presented it is clear that the students and professors involved perceived the program as very worthwhile. The trainees participated in a variety of research activities, many of which resulted in articles, papers and technical reports. The contributions by the trainees were highly regarded by the professors directing the projects.

The trainees especially valued the experience of attending a professional convention (AERA), working as a part of a research team, and the seminar presentations by the instructor. Those aspects of the program receiving the lowest ratings were the field trips to other universities and the opportunity to interact informally

with professors, graduate students and other trainees at AERA (even those aspects of the program rated lowest by the trainees had above average mean ratings on the scale used).

Because of involvement in the program several trainees have continued on to graduate school to pursue careers related to educational research.

It is clear that the program was very successful. Even though the federal support for the program has terminated, the value of the program was judged so great that it has become a part of the continuing program of the Education Department. This year 18 trainees are in the program.

It is recommended that other universities implement similar programs. We are optimistic that through the training provided in this program, we have launched a number of young people on the way to careers in educational research and that they will make significant contributions to the improvement of public education.

Measurement Text

1. Thorndike, R. L. & Hagen, Elizabeth. Measurement and Evaluation in Psychology and Education. Second Edition, New York, John Wiley & Sons, Inc., 1961.

Statistical Texts

2. Gotkin, L. G. & Goldstein, L. S. Descriptive Statistics: A programed textbook. Vols. 1 & 2, New York, John Wiley & Sons, Inc., 1964.

3. McCollough, Celeste & Van Atta, L. Statistical Concepts: A program for self-instruction. New York, McGraw-Hill Book Co., 1963.

Research Design Text

4. Kerlinger, F. N. Foundations of Behavioral Research: Educational and Psychological Inquiry. New York, Holt, Rinehart and Winston, Inc., 1964.

## Appendix A

Evaluation sheet for the Purdue Undergraduate Research Training Program.

To: Students in the URT Program

From: VanMondfrans

Re: Evaluation of your experience to ascertain need for change

Please fill out the following rating sheet as carefully as you can. The information gained will be used to help us change and improve our efforts in the URT program next year. You are to fill in the grid which corresponds to the intersection of two types of factors. The first set of factors relates to the various facets of the URT program such as taking field trips. The second set of factors relates to possible types of outcomes such as motivation or amount learned. So, if you were considering the worth of field trips with respect to how much you learned you would put a number in the box which is at the intersection of the row for field trips and the column for amount learned. The number you use will indicate your judgement as to the worth of the activity (as designated by the row) in light of the type of outcome (as designated by the column). The numbers are described as follows:

5 indicates the activity was extremely valuable in obtaining the type of outcome

4 indicates the activity was above average in value in obtaining the type of outcome

3 indicates the activity was average in value in obtaining the type of outcome

2 indicates the activity was below average in value in obtaining the type of outcome

1 indicates the activity was extremely unvaluable in obtaining the type of outcome

Name _____

| Type of Activity | Type of Outcome | | | |
|---|---|---|---|---|
| | Arousing interest in or motivation to learn the skills of educational research | Potential value for me as a future teacher or researcher | Amount learned | Impact on my future plans with respect to educational research |
| 1. Participation in the research activities of my cooperating professor. | | | | |
| 2. Field trips to other universities (overall ratings) | | | | |
| 2A. Listening to presentations by researchers of their projects. | | | | |
| 2B. Visiting various types of laboratory situations and viewing or participating in the types of tasks being presented. | | | | |
| 3. AERA (overall ratings) | | | | |
| 3A. Going to paper reading sessions or invited addresses. | | | | |
| 3B. Interacting with other URTs, graduate students and professors on an informal basis. | | | | |
| 4. Presentations by Van Mondfrans | | | | |
| 5. Presentations of Purdue faculty members of their research projects. | | | | |
| 6. Interactions with other URTs, graduate students and professors at Purdue. | | | | |

In the space left and on the back of this paper, would you please comment on your feelings about this experience and/or changes you think might make a similar experience more valuable.

## Appendix B

## Course Outline for Seminar

EDUCATION 590: SEMINAR IN MENTAL MEASUREMENT & RESEARCH METHODOLOGY

Saturday 9:30 - 12:30 A.M.

3 credits

Sept. 17 — An Overview of the Undergraduate Educational Research Training Program.
Text: T & H "Historical and Philosophical Orientation" pp. 1-16; "Marking and Reporting" pp. 484-520; "Tests in the Selection of Personnel" pp. 542-563.
(11:30 A.M. limit)

Sept. 24 — Research Orientation: Overview of Methods.
Text: G & G Unit I or Mc & Van Chapters 1 & 2.

Oct. 1 — Elementary Statistical Concepts.
Text: G & G Units II, III, & IV or Mc & Van Chapters 8 & 9.
T & H "Elementary Statistical Concepts" pp. 96-124.
(11:30 A.M. limit)

Oct. 8 — Measures of Central Tendency and Dispersion.
Text: G & G Units V & VI.
(11:30 A.M. limit)

Oct. 15 — Visiting researchers:
Professor Richard B. Smith, Educational Psychology.
"Taxonomies and Theory in Educational Research"
Professor Phyllis Lowe, Home Economics Education.
"Application of Taxonomies and Theory to Educational Problems"
Text: T & H "Overview of Measurement Methods" pp. 17-26; "The Teacher's Own Tests" pp. 27-59; "Preparing Objective Tests" pp. 60-95.

Oct. 22 — Visiting researchers:
Professor Ernest McDaniel, Educational Research Center.
"Aspects of Mental Measurement in Education"
Professor James Clouse, Agriculture.
"A Research Study in Agricultural Education"
No text assignment.

Oct. 29 — No class

Nov. 5 — The Normal Curve Norms.
Text: G & G Unit VII or Mc & Van Chapters 10 & 11.
T & H "Norms and Units for Measurement" pp. 124-159.

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|---|---|
| Nov. 12 | Visiting researcher:<br>Professor Robert Kane, Mathematics Education.<br>"Probability and Statistical Hypothesis"<br>Text: Mc & Van Chapters 12 & 13. |
| Nov. 19 | Probability and Statistical Hypothesis.<br>Text: Mc & Van Chapters 12 & 13.<br>(11:30 A.M. limit) |
| Nov. 26 | No class |
| Dec. 3 | Visiting researcher:<br>Professor John Feldhusen, Educational Psychology.<br>"Essential Qualities of Measurement Procedures"<br>Text: T & H "Qualities Desired in Any Measurement Procedure" pp. 160-206. |
| Dec. 10 | Correlation<br>Text: Mc & Van Chapters 20, 21, & 22; or G & G Unit IX. |
| Dec. 24 | No class |
| Dec. 31 | No Class |
| Jan. 7 | Visiting researcher<br>Professor Ronald Johnson, Educational Psychology.<br>"Research Studies of Forgetting and Retention and an Approach to Assessing Attitudes Toward Smoking"<br>Text: T & H "Standardized Tests of Intelligence or Scholastic Aptitude" pp. 219-260; Appendices A & B. |
| Jan. 14 | Visiting researchers:<br>Professor Kathryn Linden, Educational Psychology.<br>"Personality Correlates of Successful Teachers"<br>Professor Richard Nelson, Counseling and Guidance.<br>"Studying the Effects of Male Models on Beginning Reading"<br>Text: T & H "The Measurement of Special Aptitudes" pp. 261-287; "Behavioral Measures of Personality" pp. 388-421; "Measurement in Educational and Vocational Guidance" pp. 521-541. |
| Jan. 21 | No Class: Instead we'll schedule individual conferences during the week of Jan. 16-21 with Professor Denny. |
| Jan. 28 | No Class |

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|---|---|
| Feb. 4 | Visiting researcher:<br>Professor Kathryn Black, Child Development.<br>"Methodological Problems of Assessing Cognitive Functions in Young Children"<br>Text: T & H "Standardized Tests of Intelligence or Scholastic Aptitude" pp. 219-259; "Achievement Tests" pp. 288-316. |
| Feb. 11 | Visiting researcher:<br>Professor Channing Blickenstaff, Modern Language.<br>"Language Learning in the Class, the Laboratory, and the Residence Environments of Purdue"<br>No text assignment. |
| Feb. 18 | No Class<br>American Educational Research Association National Meeting in New York. (More about this later) |
| Feb. 25 | Visiting researcher:<br>Professor M. Endres, Officer in Charge of the Purdue Educational Research Center.<br>"Research in American Education: Direction, Scope, and Opportunities"<br>No text assignment. |
| Mar. 4 | Visiting researcher:<br>Professor Charles Hicks, Head, Department of Education.<br>"Application of Statistical Techniques - T Tests"<br>Text: Mc & Van Chapters 15 & 16. |
| Mar. 11 | Application of Statistical Techniques - Analysis of Variance.<br>No text assigned. |
| Mar. 18 | Visiting researcher:<br>Professor William Asher, Professor of Education and Psychology.<br>"Utilization of the Computer in Educational Research."<br>No text assigned. |
| Mar. 25 | No Class |
| Apr. 1 | No Class |
| Apr. 8 | Visiting researcher:<br>Professor Charles Hicks, Head, Department of Education.<br>"Application of Statistical Techniques"<br>No text assigned. |
| Apr. 15 | Visiting researcher:<br>Professor Thomas Leidy, Measurement & Research Center.<br>"Large Scale Testing Programs"<br>Text: T & H "Planning a School Testing Program" pp. 444-483. |

| | |
|---|---|
| Apr. 22 | Visiting researcher:<br>Professor William Asher, Professor of Education and Psychology.<br>"Special Problems in Data Analysis"<br>No text assigned. |
| Apr. 29 | **Visiting researcher:**<br>Professor Robert Snodgrass, Educational Psychology.<br>"Reliability and Validity: Uses and Misuses"<br>Text: T & H "Qualities Desired in Any Measurement Procedure" pp. 160-206; **Appendices** D & E. |
| May 6 | No Class: We support mothers, mothering and motherhood. |
| May 13 | Dr. Denny<br>Text: T & H "Questionnaires and Inventories for Self-Appraisal" pp. 317-350;<br>"The Individual as Others See Him" pp. 351-387. |
| May 20 | Dr. Denny<br>No text assignment. |
| May 27 | No Class: Individual conferences with Professor Denny during the week of May 22-27. Summary and evaluation of the program. |

Course Text: Thorndike, R. L. & Hagen, E. MEASUREMENT AND EVALUATION IN PSYCHOLOGY AND EDUCATION
Second Edition, John Wiley & Sons, Inc. July, 1965.

## Appendix C

Bibliography of research products resulting from projects on which trainees worked.

## Journal Articles

Endres, Mary P., & Evans, Merry J. Some effects of parent education on parents and their children. Adult Education Journal, XVIII, 2, 1968, 101-111.

Johnson, R. E., & Rosenthal, Ellen. Influence of guessing on measurements of immediate and delayed retention. Journal of Educational Measurement, 5, No. 2, Su., 1968.

Kane, R. B. Computer generation of semantic differential questionnaires. Educational and Psychological Measurement, in press. Trainee Bonnie Havel aided in this study.

Kane, R. B. Measuring attitudes of prospective elementary teachers toward four academic disciplines. Journal of Teacher Education, in press. Trainees Jeanette Haag and Bonnie Havel contributed to this research.

Kane, R. B. Semantic differential factor structure with concepts and subjects from education. Journal of Experimental Education, in press. Trainee Bonnie Havel contributed to this research.

Kane, R. B. Measuring attitudes of prospective teachers towards mathematics and three other academic areas with the semantic differential. Submitted to Arithmetic Teacher. Trainee Bonnie Havel contributed to this research.

## Papers Presented at National Conventions

Bahlke, Susan J. and Feldhusen, J. F. Componential evaluation of creativity instructional materials. A paper presented at the annual meeting of the National Council of Measurement in Education, Los Angeles, February, 1969. Undergraduate trainees Donna Burkhart and Linda Hensley made substantial contributions to this research.

Denny, T., Starks, D. D., & Feldhusen, J. F. Prediction of divergent thinking and creative performance over a four-year period. A paper presented at the annual meeting of the American Psychological Association, Washington, D. C., 1967. Trainees Mary B. Muller and Sally Fosbrink worked on all phases of this research.

Ferris, D. R, Feldhusen, J. F., & VanMondfrans, A. P. The relationship between academic grades and creativity test scores derived from four different methods of testing. A paper presented at the annual meeting of the American Educational Research Association, Los Angeles, California, February, 1969. Trainees Donna Burkhart and Linda Hensley contributed to this research.

## Papers Presented at National Conventions (contd)

Houser, R. L., & Linden, Kathryn W. Comparison between univariate and multivariate analyses of predictors for career commitment to education. A paper presented at the annual meeting of the National Council of Measurement in Education, Los Angeles, February, 1969. Trainees Elizabeth Ann Miller and Dorothy Carlton aided in the data collection.

Linden, Kathryn W., & Houser, R. L. Discriminate analysis of predictors for career commitment to education. A paper presented at the annual meeting of the American Educational Research Association, Chicago, February, 1968. Trainees Elizabeth Ann Miller and Dorothy Carlton contributed to this research.

Starks, D. D., & Feldhusen, J. F. The utilization of factor scores from biographical information to predict learning within a college course. A paper presented at the annual meeting of the American Educational Research Association, Chicago, February, 1968. Trainee Elaine Chavers aided in this research.

VanMondfrans, A. P. A review of types of exercises suggested by selected remedial reading exercises. A paper presented at the annual meeting of the National Society for Programmed Instruction, San Antonio, April, 1968. Trainee Donna Burkhart aided in the preparation of this paper.

VanMondfrans, A. P., Feldhusen, J. F., & Ferris, D. R. Four methods of testing for divergent thinking. A paper presented at the annual meeting of the National Council of Measurement in Education, Los Angeles, February, 1969. Trainees Thomas Barnhart, Donna Burkhart and Linda Hensley contributed to this research.

## Technical Reports

Benning, J. J., Feldhusen, J. F., & Thurston, J. R. Delinquency prone youth: Longitudinal and preventive research. A technical report to the National Institutes of Health, 1968. Trainee Mary Wall assisted in the computer analysis of the data for this project.

Kane, R. B. Reducing proximity error in administering the semantic differential. Technical report to USOE, Bureau of Research, Project No. 7-E-189, 1968. Trainee Bonnie Havel aided in this research.

Kane, R. B. Use of the semantic differential technique to measure prospective elementary school teacher attitude toward mathematics and three other subjects. Technical report to USOE, Bureau of Research, Project No. 7-E-053, 1968. Trainee Bonnie Havel contributed to this research.

Leathem, P. J. and Leidy, T. R. Purdue Opinion Panel political survey results: 1948-1967. A special report of the Purdue Opinion Panel Measurement and Research Center, Purdue University, 1968.

Leidy, T. R., Starry, A. R., Karasick, B., & Smart, B. Youth's attitudes toward the selective service system. A special report by the Purdue Opinion Panel, Measurement and Research Center, Purdue University, Lafayette, Indiana, 1967.

Leidy, T. R., Starry, A. R. Vocational plans and attitudes toward School -- youth's attitudes toward the selective service system. Purdue Opinion Poll National Report No. 78, 1966. Trainee Bernard Karasick contributed to this research.

High school students' leisure time activities and attitudes toward network television -- youth's attitudes toward the selective service system: II. Purdue Opinion Poll National Report No. 79, 1967. Trainee Bernard Karasick contributed to this research.

High school students look at the future -- youth's attitudes toward the selective service system: III. Purdue Opinion Poll National Report No. 80, 1967. Bernard Karasick aided in this research.

Thurston, J. R, Brundik, Helen L., and Feldhusen, J. F. The prediction of success in nursing education. A technical report to the National Institutes of Health, 1968. Mary B. Muller and Sally Fosbrink assisted in the computer work for this project.

## Computer-Assisted Instruction Programs

Feldhusen, J. F., Chavers, Elaine, & Riemen, Celerte. The Flanders system for classroom interaction analysis. A program for computer-assisted instruction, implemented on an IBM 1050-1401 system at Purdue University, approximately two hours of instruction. It has been debugged and twelve students have been through the program.

## Computer-Assisted Instruction Programs (contd)

Feldhusen, J. F., Spinelli, M., & Jacobson, R. Fortran IV Programing. A program for computer-assisted instruction, to be implemented on a CDC 6500 system at Purdue University, approximately four to six hours of instruction. Debugging trials have been run on several segments.

## Working Papers

McDaniel, D. E., & Maish, Gail W. Student preferences and evaluation of faculty. Working paper. Available from principal author at PERC, Purdue University, Lafayette, Indiana, 1968.

Smith, W. F., & Littlefield, R. L. The language laboratory and the electronic classroom: A comparison. A report to Indiana Language Program for Research during the 1966-67 academic year. Lafayette, Indiana: Purdue University Department of Modern Languages (mimeo), 1967, 72 pages. Trainee Jane Elgin contributed to this research.

Smith, W. F. The effects of radio broadcasts of structural drills on student performance in beginning French, German, Russian and Spanish at the college level. Working paper I: Statement of problem, review of research and experimental design. Lafayette, Indiana: Purdue University Department of Modern Languages (Xerox), 1966, pp. 15. Trainee Jane Elgin contributed to this research.

## Thesis and Dissertation

Houser, R. L. Comparison between univariate and multivariate analyses of predictors for career commitment to education. An unpublished master's thesis, Purdue University, 1968. Trainees Elizabeth Ann Miller and Dorothy Carlton aided in this research.

Starks, D. D. The utilization of biographical information in the prediction of academic performance. Unpublished doctoral dissertation, Purdue University, 1967. Trainee Elaine Chavers contributed to this research.

# Appendix D

## Excerpts from trainee evaluations of the program

Evaluations of Program

By Trainees

Gail Maish

I feel that my experience in the URT program this year is by far the most valuable experience I had at Purdue. For the first time I was really challenged and my heart was in my work. Dr. McDaniel is a tremendous person and I feel very fortunate to have had the opportunity to work with him. His enthusiasm inspired me more than I thought possible, and I have great hopes of pursuing my interests in educational research in graduate school. Thanks to all for giving me this valuable opportunity.

Linda Hensley

For one of the rare instances in my educational career, I feel as if I have done something important. As a matter of fact I have felt this way since last April when I applied for the URT program. Whether I actually have done anything of importance remains to be seen: yet I feel this Undergraduate Research Program as a whole is very important. All too rare are the opportunities for an undergraduate to participate in a program wherein one deals with concepts and methods which so often are read of in class texts and relegated to the far recesses of one's mind---probably never to be recalled again.

Paul Leathem

Through the URT program, I have become interested in educational research. As to what I will actually do when I complete my master's degree, I will describe this sometime within the next year.

The URT program has been a rewarding and enlightening experience, and I have strongly encouraged several of my friends to apply for the program. I found the work to be challenging and interesting. I hope that the program will be continued and even, if possible, expanded, as it has given me a much better understanding of an entire field that I hardly even knew existed.

Patricia Powell

I have viewed this year's experience as a very unique opportunity, and I have often felt that I could have participated more fully than I did. The best point about the program is that there is almost no ceiling on opportunities - students are encouraged to do and learn as much as they want to and feel they have time for.

Claudia Hart

To my good fortune, Mrs. Perloff was careful in her selection of project in which she involved me. In this project, I was able to see the beginning, growth, and completion of the research. This was the greatest advantage I was given, and, for the record, I would suggest that if possible, any future URTs be given a project which they can be involved in from beginning to end. These projects may be somewhat simpler than some of the complex basic research with which educational psychology is concerned, but the simpler research gives a student a chance to dig in and find out what time, thought, and work is needed to construct and execute a well designed research experiment. In all, I would like to repeat that my experience with the project has been invaluable, and that I have thoroughly enjoyed being part of the URT program. I hope that, via some funds, this opportunity will continue to be offered to Purdue students.

Patricia Powell

Having had the opportunity to participate in the undergraduate research program this year has greatly broadened the aspects of my college education. It has introduced me to a field of study with which I was only nominally acquainted and has given me a better understanding of education in general, and of educational research in particular.

Bonnie Havel

This opportunity was very definitely a learning experience in every respect. Not only was I able to learn something about research, but I also learned something about the people involved in this type of work. It was a rewarding experience to work with staff members and graduate students, to see their dedication to work in their field, and to develop an understanding of the value of research in education.

Ron Houser

To me Education 590 is the most stimulating and inspiring course I have ever taken. I don't mean this in the sense of flattering Dr. Denny, because I have come to know him well enough that I know he wants an honest answer or criticism no matter which way it is. The anxiety and frustration which accompanies every college course is noticeably lacking in Education 590. In their place has developed a non-threatening attitude of mutual growth through discussion and understanding.

The enthusiasm of the students and the professors is an extra which I have not found anywhere else in the University. I'm sure

it must be there, but it has been hidden from me. To me, this enthusiasm is by far the most important asset for the success of any form of education.

The field trips are worth every minute spent on them. The Webster trip has inspired me and caused me to do much serious thinking about operant conditioning and its ramifications on human development.

## Appendix E

Papers by two trainees describing their involvement in the research process

## Evaluating A Parent Education Program

My research assignment was to work with Dr. Mary Endres to evaluate a widely used parent education program, Parenthood in a Free Nation (PIFN). This program was developed in the Parent Education Project at the University of Chicago by Professor Ethel Kawin. Three volumes of Parenthood in a Free Nation and the Manual for Group Leaders and Participants were designed to help parents acquire the knowledge and understanding needed to bring up mature, responsible citizens. We were concerned here with Volume I, Basic Concepts for Parents, which includes the following six topics for study-discussion groups: 1) Feelings of Security and Adequacy, 2) Understanding of Self and Others, 3) Democratic Values and Goals, 4) Problem-Solving Attitudes and Methods, 5) Self-discipline, Responsibility, and Freedom, 6) Constructive Attitudes Toward Change.

The purpose of our research study was to evaluate the effectiveness of widely used parent education materials and methods such as those advocated in PIFN. Also, we hoped to identify the kinds of evidence necessary to provide an adequate evaluation of parent education.

The basic questions we hoped to answer were : 1) Are there any significant differences in the amount of factual information, feelings and attitudes, and overt behavior of parents of fourth-grade children when their parents have participated in PIFN? 2) Are there any significant differences in the self-concepts of fourth-grade children whose parents have participated in PIFN?

For our sample we used three fourth-grade classes and their parents from Battleground School (Tippecanoe School Corporation). The children were randomly assigned to the classrooms when they enrolled last September. We then randomly assigned the three rooms as experimental, placebo, and control.

The parents in the experimental group completed the series of study-discussions outlined in Volume I of PIFN. This group met twice a month, and members of the group acted as discussion leaders at each meeting.

The parents in the placebo group met once a month and had programs designed completely aside from parent education. For instance, we had a presentation of travel slides, a hobby night, and a Christmas decorating "idea" night.

The parents in the control group received no treatment.

We used three testing instruments in gathering our data. One of these was the Piers-Harris Self-Concept Scale, which was

administered to the children in September and will be re-administered during the month of January. The other two were taken by the parents of all three groups. We had a factual knowledge test which was designed by members of the Purdue Educational Psychology Staff and is still being checked for validity and reliability. This instrument tested for factual information found in Volume I of PIFN. The third instrument was the Parent Attitude Research Instrument (PARI). This scale is designed strictly for use with upper-middle-class families, and we hope to use this as one method for studying parental attitudes.

In addition to the instruments, we planned to have parent-teacher interviews and home visits. We hoped to learn two things from the interviews: 1) Do the parents communicate with their children and on what level? 2) What types of activities do the parents and child engage in? The home visits would be another method of observing interaction between child and parents.

We are now involved in actually gathering our data. At the last meeting with the experimental group we administered the testing instruments. In January we will give these tests to both the placebo and the control groups. We also wish to proceed with the interviews and observations. This will involve setting up a scale for the teacher to use in reporting her opinions. We want the teachers to be as objective as possible, and therefore, we plan to have some practice sessions with them to be sure they are gathering the information we need.

We are striving to gather most of our data during January and will begin to analyze it immediately so that we can have our final report written in May. We have quite a bit of planning to do as far as the interviews and observations are concerned; therefore, I am not really qualified to state any proposed schedule at this time.

## Excitement and A Challenge

In October, 1967, I joined the Undergraduate Research Trainee program and began work with Professor Ernest McDaniel. At the time that I became a part of the program, Dr. McDaniel had several projects underway and I became quickly interested in and eventually involved in many of them.

Our major project which involved the most extensive part of our research was in the area of instructor and student attitudes at the college level. It was our initial intention to modify the Minnesota Teacher Attitude Inventory such that it would be applicable for instructors at the college level. Dr. John Feldhusen's original modification for college instructors was called the Instructor Attitude Inventory and contained 150 items. It had

been administered and an item analysis had been run on the results. We continued the study and Form IV of the Instructor Attitude Inventory consisted of 65 items which remained after a series of three testings and item analyses.

Form IV of the Instructor Attitude Inventory, the Purdue Rating Scale for Instruction, and a previously written Record of Teaching, Research, and Publication were then administered to 34 instructors. The data collected was run through the computer as a correlation matrix in order to study the relationships among the different aspects of an instructor's production rate and his hours in the classroom, his attitudes toward teaching, and his teaching as evaluated by his students. The results were inconclusive and we set out to improve the validity of the Instructor Attitude Inventory after concluding that our problems lay within that instrument.

## Appendix F

Evaluation of individual trainees by professors with whom they worked

Evaluation of Individual Trainees
By Professors With Whom They Worked

Professor Kathryn Black evaluating Linda Bowman

Linda is highly enthusiastic about the program and about her work! Both experiences should prove highly valuable background for her as she goes on to graduate school. She will continue in some area of psychology concerned with children or developmental problems, and probably will be interested in an emphasis on assessment or measurement. The exact field that Linda does her work in as a graduate student and professional worker will depend a great deal upon the interests and abilities of those around her. She is intellectually curious and perceptive, but it is extremely important to her that she be working for or with someone who is competent and enthusiastic. (This may be highly healthy and adjustive for a female in our society.)

Professor David Starks evaluating Sally Fosbrink

This semester I have been fortunate in having Miss Sally Jo Fosbrink work with me as an Undergraduate Research Trainee. Although she has often worked on other projects, her primary responsibility has been to assist in a study of the utilization of biographical information in academic prediction. Up to the present she has been active in the administration, scoring, and preparation for analysis stages of the research, and is now engaged in the interpretation of some 14 factor analyses of the form. An additional project which she has undertaken is that of establishing of norms for the Nelson-Denny Reading Test based upon data from about 700 Educational Psychology 285 students at Purdue.

Sally has entered into the work with enthusiasm and has worked diligently. She has made real efforts to understand the background of the Biodata Study. Although she does not have a strong background in the quantitative methods employed (factor analysis and multiple regression), she nevertheless appears to have a good intuitive grasp of the statistical techniques and is able to understand and interpret results.

Professor James P. Clouse evaluating Mary German

It has been a real pleasure to have the experience of working with Mary German this first semester of the school year. Although she was out student teaching for eight weeks, which created some problems concerning the completion of the work she was doing, I

found Mary to be extremely meticulous and hard-working in all that she did.

Mary plans well and is extremely careful in being sure that she has things well organized and ready to present before she comes in to visit with me or before she presents something to other people. She has worked part-time with me on the Agricultural Education Intern Program which she presented to the Saturday morning seminar in October, and she has worked part-time with Dr. R. R. Bentley on his morale study funded by the U. S. Office of Education.

Professor Robert Snodgrass evaluating Jee Shively

1. He has been consistently interested and intelligent.
2. By reading and discussion he has been at least partially enlightened about a special problem of test reliability.
3. He has worked out a goodly number of test items suitable for our investigation.

Professor Mary Endres evaluating Merry Evans

Merry Evans is the undergraduate assigned to work with me in a program of measuring the effectiveness of a parent education program at Battlegound in Tippecanoe County. Merry has been very responsible in carrying out her assignments. She attended the parent education meetings for the experimental group, has participated actively in the meetings with the placebo group, and has participated in the planning in both groups.

As to the research project, she has become familiar with the instruments to be used. She checked about 90 Piers-Harris Concept Scales which were administered. She searched the literature for information on the use of interviews and observation as means of gathering data. At our weekly seminar, she actively participates in the discussions. While she has been quiet and restrained in her behavior, she has been most responsible.

Professor Phyllis K. Lowe evaluating Dianne Kendall

Mrs. Kendall came to the program with an inquiring mind, an eagerness to learn and much creativity. As she assisted with the conceptualization and writing of a proposal focused on testing a training program for teachers through an experimental design, She was selective in the material she suggested from the literature she reviewed. Evidence of an ability to carefully analyze research design was exhibited as she observed how clean the research had been abstracted.

Quick to learn, Mrs. Kendall computed Chi squares and contingency

coefficients with accuracy. She refused to settle for "following the recipe", but wanted to know why she did what she did.

It was rewarding to observe Mrs. Kendall associating the research in progress with the educational program being conducted. With little to no guidance, she pinpointed the value the research results had for the program.

Professor Thomas R. Leidy evaluating Bernie Karasick

Bernie Karasick has met or exceeded all my expectations. He is reliable and responsible; he writes well and works effectively on his own.

This past semester he has helped with the administration and analysis of Poll 78 of the Purdue Opinion Panel. We are now writing up the results of that study. Mr. Karasick is handling certain segments of the report. The study has two separate sections: Youth's Vocational and Educational Plans and Attitudes toward School and Youth's Attitudes toward the Selective Service System.

Professor John Feldhusen evaluating Barbara Dilts

URT Trainee Barbara Dilts has been a steady worker on the Plymouth study. She appears faithfully and shows real concern about the progress of the creativity project. However, we have a need to meet more regularly and to get back to theoretical discussions. Her work will continue in the 2nd semester with comparable activities, but I hope with more time for talk.

Professor Kathryn Linden evaluating Elizabeth Miller and Ronald Houser

Both Betsie and Ron have been very eager and very active this past semester. Moreover, both express great ego-involvement with the research. Both accept responsibility eagerly and seem able to go ahead on their own without being too dependent for direction. I am extremely pleased with their work, and I expect them to continue to be active, eager trainees.

# Appendix G

## Program evaluations by professors who worked with trainees

## Program Evaluations By Professors Who Worked With Trainees

Professor Kathryn Linden

The Undergraduate Research Training Program at Purdue University since its inception three years ago has, in my opinion, met successfully the objectives of the program. Trainees have expressed sincere enthusiasm for the program, and the fine trainees who have been assigned to me over these years have accomplished even more than I had anticipated originally. One of them is currently pursuing a doctoral program in Educational Research, and two other students are engaged in graduate study elsewhere. I believe that it is from such involvement as a senior undergraduate that our strongest educational researchers of the future will be derived.

Professor Wm. Flint Smith

The Undergraduate Research Trainee (URT) Program has several strong points but the most salient, in my mind, is the involvement of the trainee, directly, in an information-seeking and an information-processing situation.

Professor Adrian Van Mondfrans

The Undergraduate Educational Research training program has been completely successful in creating interest in careers in educational research and developing some research competence among bright undergraduates. I think it was a wise decision to enroll students with various majors, not just prospective teachers. The field of educational research needs bright people with various kinds of special knowledge and training. Hopefully many of the trainees will end up in graduate educational research training and in careers in educational research.

Professor Ronald Johnson

My overall evaluation is favorable. In large, the advantages that we thought would result from the program have occurred (see previous listing of probable advantages in original proposal.) It is my opinion that OE made a bad decision in deciding not to continue the program.

Professor Richard Nelson

I could cite the following attitudinal outcomes (1) I personally became much more vividly aware of the research potential possessed

by undergraduate students--to the extent that I consider this to be a major and relatively untapped resource for significant research in the university setting. (2) My trainee, more through the training program than through my efforts, became far more alert to research procedures and needs for research than I have seen in undergraduate students. This is a great idea which is extremely worthy of further development.

Professor Wm. Asher

I think the program is outstanding, enjoyed it, and particularly, liked teaching in it. The exceptional high quality, intelligence and social awareness of the students was most enjoyable.

Professor John Feldhusen

The Undergraduate Research Training program has been a great boon to me personally and to our educational psychology faculty in general. We have been able to do much research and to do it well because of this program. The guidelines of the program forced us to be systematic and productive in research, and the commitment to involve a trainee in the effort provided additional motivation for us as professors to perform well. Furthermore, the trainees were all exceptionally bright and had good academic backgrounds. Thus, they brought a wealth of good ideas and good thinking to our research efforts. I am pleased that the program will continue with local support now that OE funds have come to an end.

Professor Kathryn N. Black

With respect to the strengths and weaknesses of the program, my reaction can be briefly stated -- It seems to me that for a student to have experience like this as an undergraduate is invaluable in determining his interests and in getting him off to a good start if he or she does go on to graduate school. I have had three good students through this program. I would not again choose to work with a student who was doing practice teaching at the same time. I do not think it is possible for the student, e.g. as for Ann, to be substantially involved as a trainee if they are also practice teaching. The students' reports to me about the program are generally positive, that is, they seem to develop an esprit de corps and to feel that they really are learning something.

Professor David D. Starks

In my work with the Purdue URT Program during the 1966-67 academic year I became highly impressed with this program. The student who worked with me was a very able person and brought a great deal of enthusiasm to her work. She, along with others I observed, learned

a great deal about research and was able to make a real contribution to the research effort. Although few of the trainees from 1966-67 have continued on in educational research, many of them should be able to evaluate research evidence in a much more discerning manner than most educational practitioners. Perhaps the most serious problems of both performance within the URT program and follow-through efforts after graduation from Purdue can be attributed to the admission procedures followed in the first year of the program. Many of the trainees were highly capable persons who had a number of responsibilities in campus organizations. These individuals were often able to do quite well but did not bring a high level of commitment to the research effort.

Professor James Clouse

The Undergraduate Research Training Program as carried out at Purdue University in my opinion was an extremely valuable and worthwhile program. The young lady who was assigned to us in Agricultural Education was very competent and did an excellent job in helping us plan over and complete our summer intern program. She was particularly adept at seeing relationships at the end of the program. She was also very good in preparing the necessary information needed for us to get the program funded a third year.

I believe that this should be expanded to provide more opportunity for undergraduate students to obtain some practical experience in educational research. I strongly encourage the continuation of the Undergraduate Research training program.

Professor Robert Kane

I am most favorably impressed by the URT concept in general and by our program in particular. Of the three URT's assigned to me over the past two years only the first one left something to be desired in initiative, work habits, and the like. Last year's and this year's trainees are both excellent. Moreover, I feel as though Bonnie Havel (last year's URT) learned a substantial amount about several phases of research activities in education. She worked with three graduate students and me in a team research program.

I would like to see more men students in the program, but I would not favor dropping admission standards to accomplish this goal.